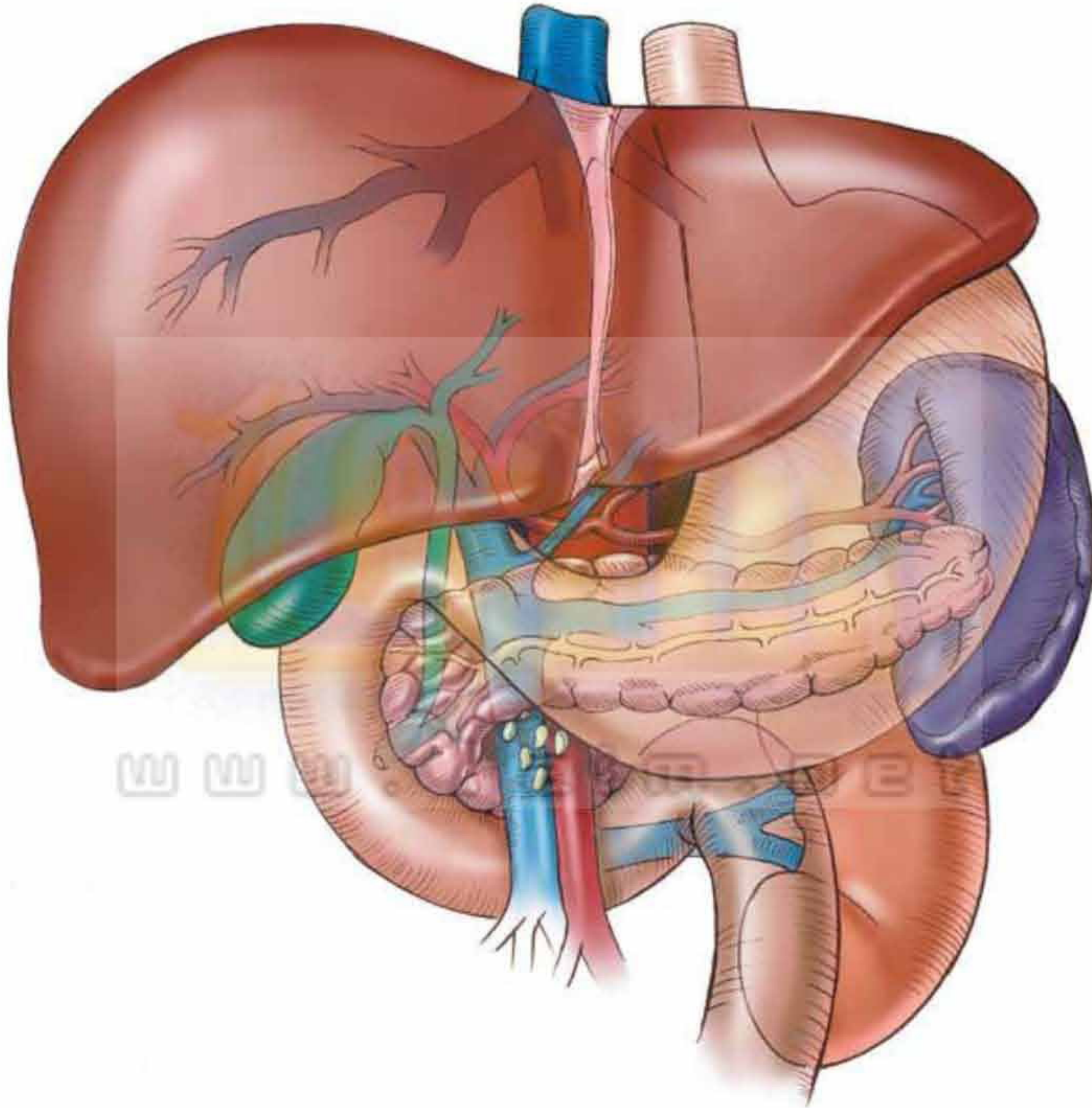


LIVER



2 0 0 9 - 2 0 1 0

Index:

- Acute hepatitis.
- Chronic hepatitis.
- Cirrhosis.
- LCF.
- hepatic Encephalopathy.
- Portal HTN.
- Ascites.
- hepatoma.

VISIT...

LANZAROTE
Caliente.COM

Viral Hepatitis

"Inflam. Of the liver parenchyma of 6ms."
causes of Acute Viral Hepatitis

Hepato-tropic

- A-B-C
- D-G-E
- F-G-?

Non-Hepato-tropic

- EBV
- HSV
- CMV

	HAU	HBV	HCV
• TYPE OF VIRUS	RNA "PICORNA = ENTERO"	DNA	RNA
• MOT	• FECO-ORAL. (Virus appears in stools 2 wks. before onset of the CLPE 1 wk. after)	• BLOOD BORNE High conc. Infection direct • PARENTAL. • TRANS-PLACENTAL. • SEXUAL / SALIVA.	• BLOOD TRANSF. Low conc. • PARENTAL.
• IP	2-6 WKS.	2-6 MS.	7-8 WKS.
• AGE	CHILD	ADULT	ADULT

> IMMUNE-RESPONSE

1) RESOLUTION	✓ (IT IS THE RULE)	✓ GOOD IMMUNE RESPONSE (CLEARANCE OF VIRUS)	✗
2) CARRIER	✗	✓ POOR IMMUNE RESPONSE esp. TO HBV (CAN'T RECOGNIZE VIRUS)	?!
3) CHRONICITY	✗	✓ BETTER IMMUNE RESPONSE 5% (CAUSING DAMAGE OF HEPATOCYTE)	✓ 50% CHRONICITY IS THE RULE. (CYTOPATHIC)
4) FULMINATION	✓ (0.5%)	✓	
> MALIGNANCY	✗	✓	✓ 4 TIMES >> HBV

➤ MARKERS OF *Viral hepatitis*

HAV MARKERS	HBV MARKERS "DANE PARTICLE"	HCV MARKERS
HA - Ab +ve Ig M ⇒ RECENT INFECTION. +ve Ig G ⇒ PAST INFECTION. (No Chronicity) "COMMON IN POPULATION >50 YS." E/M ⇒ VIRAL PARTICLES. HBV MARKERS	Surface HBs Ag APPEARS → V. EARLY B4 ↑ TRANSAM. DISAPP. → < 6MS. AFTER INFECTION 1) Infection with HBV but since when?! So we do c Ab. 2) +ve S Ag < 6 ms. → Acute Hepatitis. > 6ms. → Chronic Hepatitis +ve s Ag with Normal enzymes Carrier or Recent Inf. ↑ Enzymes Mild ↑ Chronic Hepatitis Marked ↑ Acute Hepatitis HBs Ab APPEAR → 3 - 4 MS PERSISTS → YS. IMMUNITY so no vaccine needed Ig M RECENT INF. Ig G OLD INF. HB sAb Alone post. Vaccine with cIgG past infection & Immunity Core HBc Ab يطلع بسرعة و يختفي بسرعة c IgM is +ve in WG (if -ve sAg & sAb) c IgM IS THE ONLY MARKER FOR RECENT HBV INFECTION bec. we can't know since when sAg & sAb were +ve !! HB cAb HB c IgM Recent Inf. HB c IgG past infection e HBe Ag Active Viral replication HIGH INFECTIVITY (ACUTE R CH.) HBe Ab Conv. LOW INFECTIVITY VIRAL MUTATION MAY OCCUR OR induced by INTERFERON → so replication is detected by DNA "PCR" → so pt. can be infected e HBV with (- ve) e Ag.	HCV Ab ↓ +ve ELISA (SCREENING) ↓ +ve RIBA (CONFIRMATORY) ↓ Infection but doesn't indicate Immunity ?!!! ↓ ملوش معنى ... مقدرش أعرف منه مناعته! so we do PCR VIRAL RNA ↓ PCR (DIAGNOSTIC) ↓ QUANTITATIVE MANDATORY

➤ Prophylaxis

	HA VACCINE	HA IG	HB VACCINE	HB IG	
	- INACTIVATED.	SERO-PREV. / ATTENUATION.			
DOSE	- 1MM THEN BOOSTER DOSE AT 6-12 MNS.	E IN 6 DAYS OF EXPOSURE	- RECOMBINANT DNA. - IM (0,1,6) - CHECK VACCINE ⇒ MEASURE HBs Ab AT 7-9 MS AFTER THE INITIAL DOSE. - INDICATIONS: A) HCW. B) HD patients. (Double the Dose dt ↓ immunity) C) NEWBORN of HB sAg MOTHERS. D) SEXUAL PARTNERS of HB sAg.	HB sAb RECENT EXPOSURE TO INFECTED BL. (GIVEN NOT EXCEEDING 1 WK.)	
VALIDITY	- 10 YS.	3-6 MS.			
INDIC.	1) CHRONIC LD. 2) TRAVELERS to endemic.	1) CONTACT "recent exposure e in 6 days" 2) TRAVELERS for short duration "3-6 ms".			NO VACCINE

Acute Viral Hepatitis

➤ **DEF.:** Acute inflam. of liver parenchyma < 6ms.

➤ **CCC. by:**

A) **PT INFILTRATION.**

B) **SWELLING OF HEPATOCYTES.**

⇒ NARROWING OF THE BILE CANALICULI.

⇒ INTRA-HEPATIC CHOLASTASIS.

C) **CENTRAL NECROSIS. (ZONE 3)**

NON - ICTERIC HEPATITIS

ICTERIC HEPATITIS

- Flu - like ...
- Nausea-**anorexia.**

MILD Hepatitis

↑ **S. BILIRUBIN < 2.5MG**
(No Jaundice ... so pass un-noticed.)
↑ **SGPT. (SPECIFIC / SENSITIVE)**

FATE ?!

RESOLUTION

CHRONIC H.
ESP. HCV

CIRRHOSIS?!

PRE-ICTERIC "VIREMIA FOR 1-2 WKS"

- 1) **F A H M** dt...viremia.
(severe Anorexia → distaste 🍴)
- 2) **Pain** IN RT. HYPO-CHONDRUM.

➤ **CL./P**

➤ **INVEST.**

- ↑ **SGPT** "IF SUSPECTED" BEC. IT'S SPECIFIC & SENSITIVE"

ICTERIC

"FEVER & JAUNDICE FOR 3-6 WKS"

- 1) **F A H M** SUBSIDES.

THEN

- 2) **Cholestatic Jaundice** dt...

swelling of hepatocytes
sclera olive-green

Dark urine
"bilirubinuria"



Clay stool
"bec. bilirubin doesn't reach intestine".

↑ **SGOT / BILIRUBIN.**

- **LIVER** ⇒ ++ & TENDER.
(dt stretch of capsule)
- **Spleen** ⇒ JUST palpable dt RES++
(DD "PTH Spleen ... SE NBs")

POST - ICTERIC "CONVALESCENCE"

Good GC.

< 6ms. > 6ms.

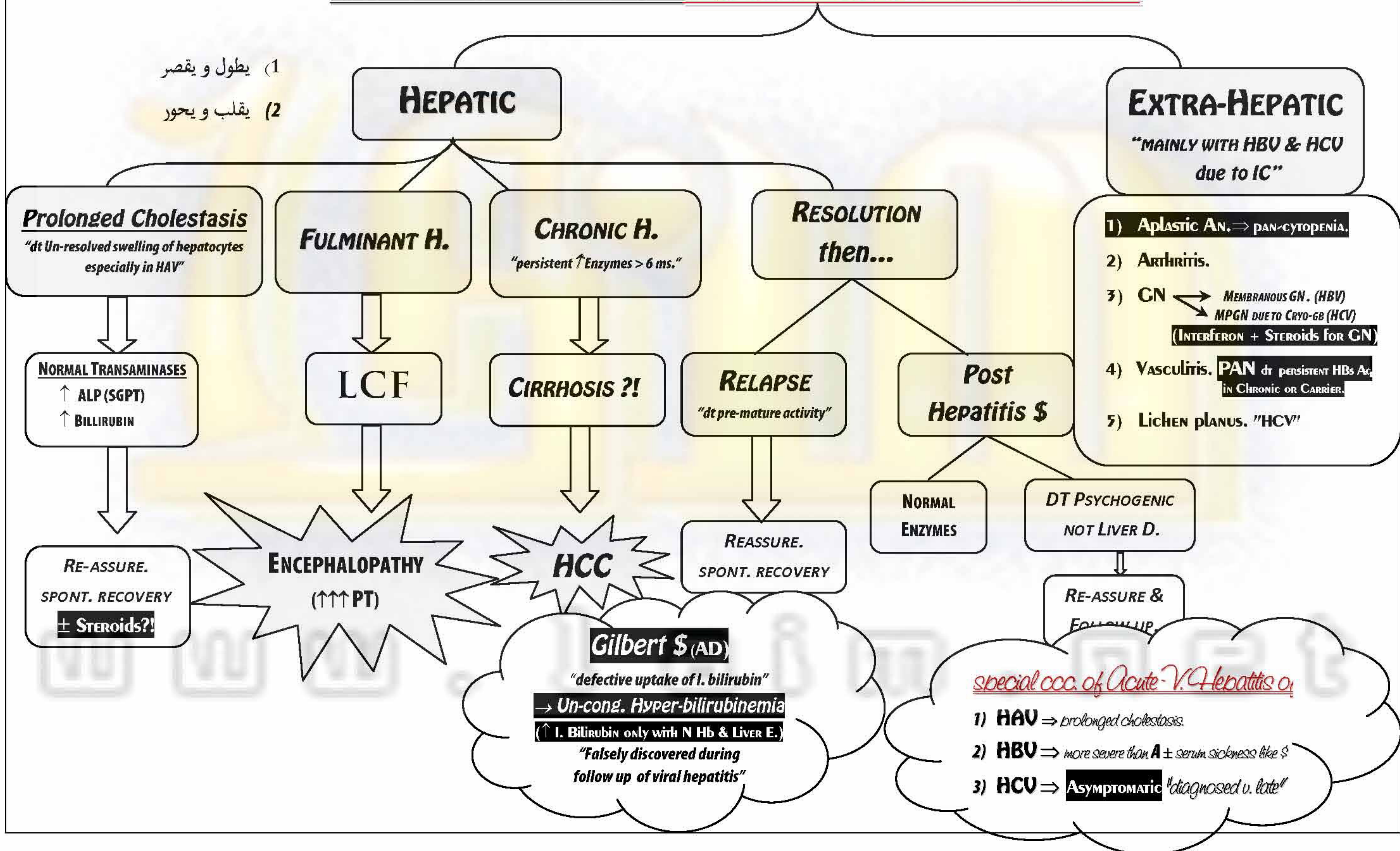
CLINICALLY &
BIO FREE

CHRONIC
HEPATITIS

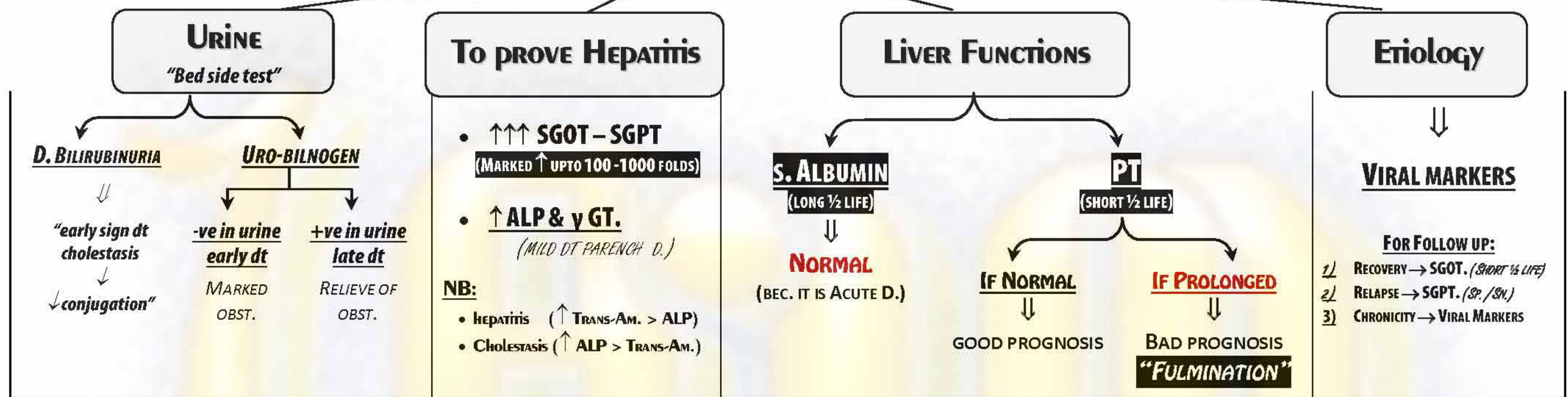
↓ **SGOT / ↓ S. BILIRUBIN**
"but Jaundice persists dt ↑ affinity of bilirubin to collagen in sclera → so we depend on s. Bilirubin not depth of Jaundice"

➤ COMPLICATIONS OF *Acute-Viral Hepatitis*

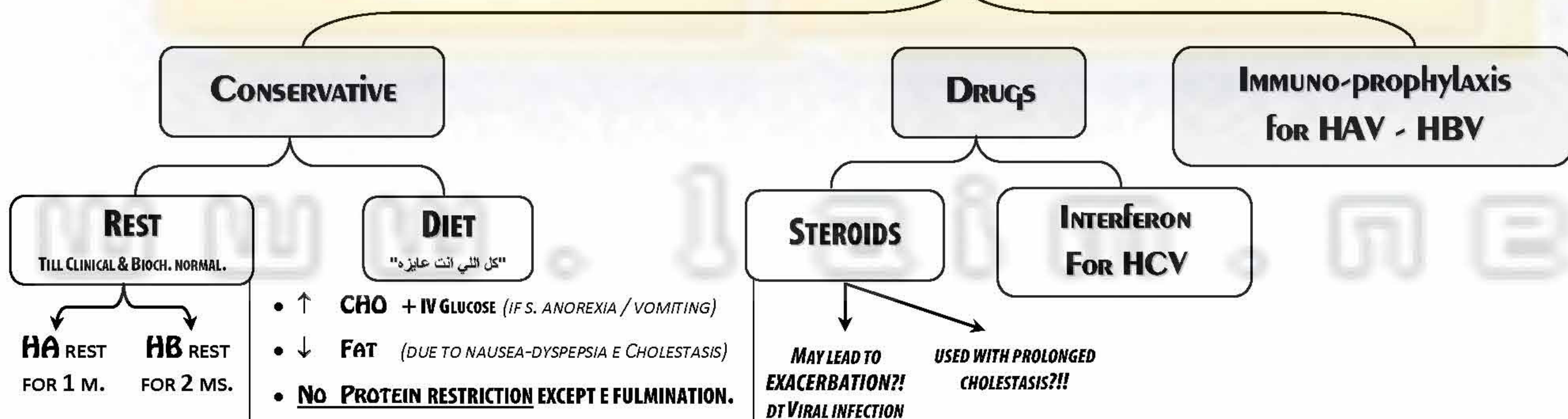
(1) يطول و يقصر
(2) يقلب و يحور



INVESTIGATIONS FOR *Acute-Viral Hepatitis*



TREATMENT OF *Acute-Viral Hepatitis*



CHRONIC HEPATITIS

"Inflam. of the liver parenchyma > 6ms w/out resolution in
Occurs in HBV / HCV not HAV"

CHRONIC PERSISTENT HEPATITIS "MILD"

CHRONIC ACTIVE HEPATITIS "SEVER"

Viral

AUTO-IMMUNE

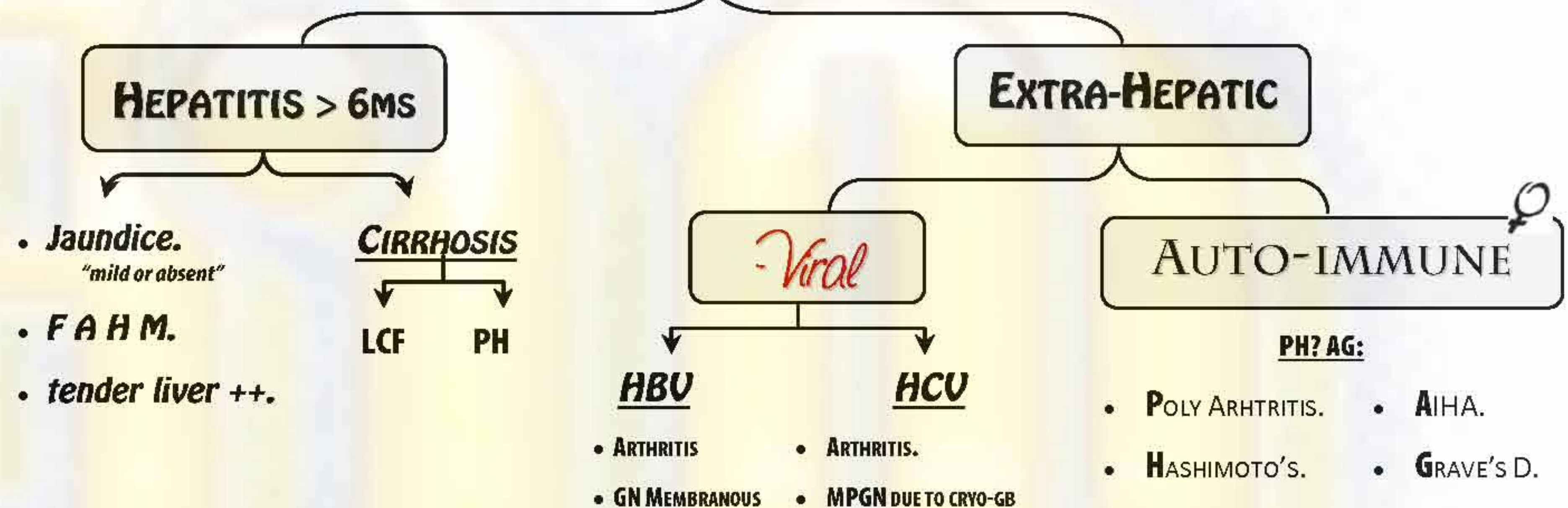
➤ **CL./P**

1) **Asymptomatic ... follows HBV.**
"discovered accidentally during routine invest."

2) **Non-specific Symptoms:**

- **Fatigue.**
- **Pain** IN RT. HYPO-CHONDRUM.
- **Fat** INTOLERANCE.

Asymptomatic up to LCF & PH



➤ **INVEST.**

1) **L. Enzymes** ⇒ ↑ SGPT / SGOT "MILD & PERSISTENT".

2) **SONAR** ⇒ -VE / MILD LIVER++

3) **MARKERS** ⇒ ± ve **HB sAg.**

4) **BIOPSY** ⇒ **PT INFILTRATION + NO LOSS OF ARCH.**

"UN-EXPLAINED & PERSISTENT ↑ ENZYMES
IS AN INDICATION OF LIVER BIOPSY"

➤ **NB: SUPER-INFECTION E HDV ...**
FLARE UP OF **MILD CH. HBV** TO SEVERE FORM.

➤ **DD** ⇒ Gilbert's S & Post hepatitis S.

1) **L. Enzymes** ⇒ MILD ↑ (3-5 FOLDS)

2) **S. ALBUMIN** ⇒ NORMAL OR (↓ IN LATE STAGE)

3) **MARKERS** ⇒ *Viral* OR

4) **BIOPSY** ⇒ **most imp. "starts in PT".**



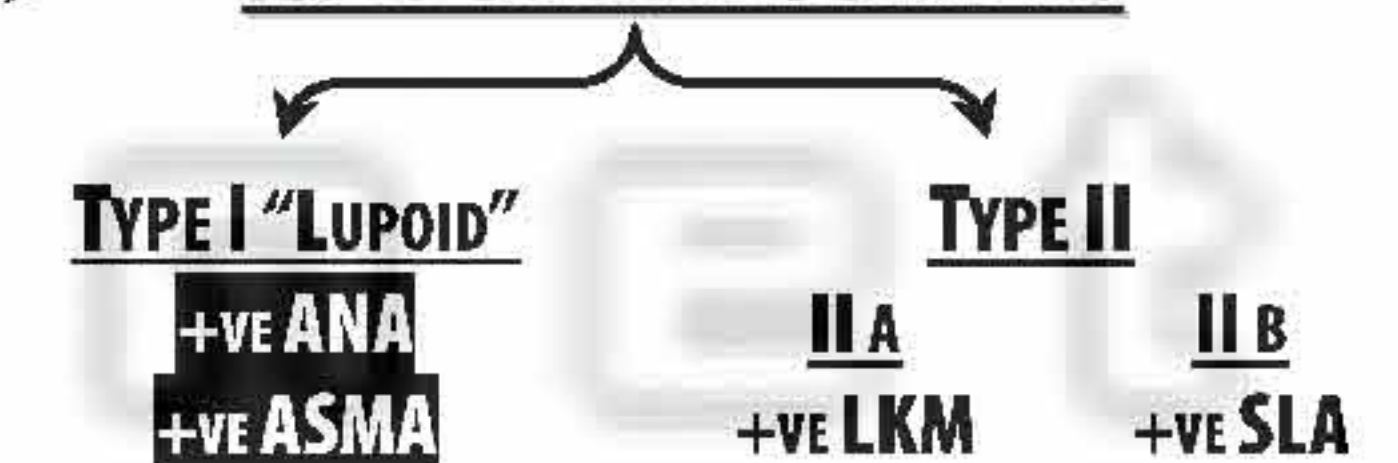
➤ **HOW TO diff. bet Types of SEVERE FORM?! HB sAg HCV**

WITH Hx & E STAIN
... GROUND GLASS APP.

SPECIFIC STAINED
BY ORCEIN.

LYMPHOID F.

AUTO-IMMUNE MARKERS



✓ **BIOPSY: Lymphoid follicles.**
plasma cell infiltration.

CHRONIC PERSISTENT HEPATITIS

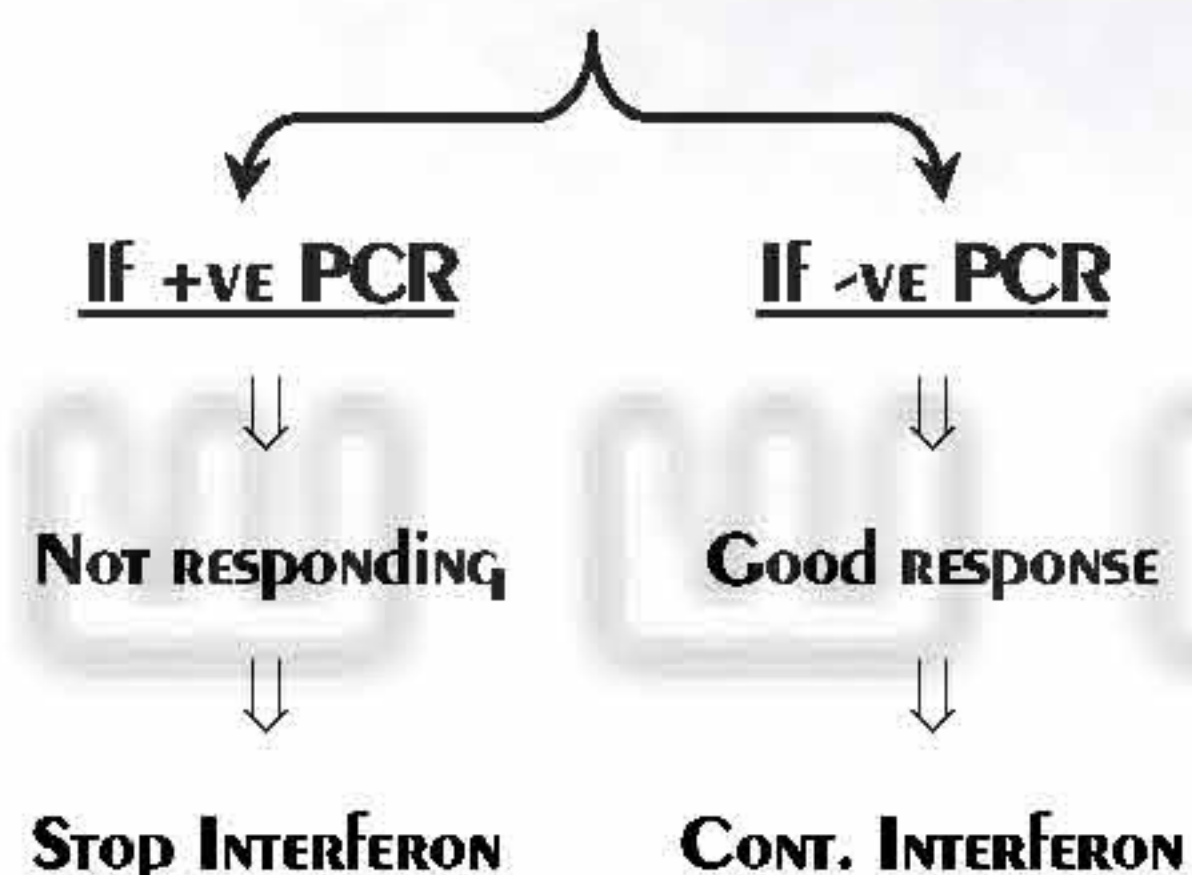
TREATMENT:

- 1) RE-ASSURE.
- 2) Follow up/ 6ms "SGPT"
- 3) Avoid hepato-toxic drugs.
- 4) hepatic support. "hepamax®"

Prognosis

- SUPER-infection E HDV ⇒ flare up of mild Ch.HBV TO SEVER form.
- DD ⇒ Gilbert's \$ & Post hepatitis \$.

MONITOR INTERFERON AFTER 3 MS



CHRONIC ACTIVE HEPATITIS

Viral

AUTO-IMMUNE

HBV

HCV

INTERFERON: "CONVENTIONAL"

• <u>DOSE</u>	• 10 MILL. U 3 TIMES / WK ↑ dose • 1/2N YR. ↓ duration.	• 3 MILL. U 3 TIMES / WK ↓ dose • 1 YR. ↑ duration.
• <u>INDICATION</u>	1) +VE HB EAG 2) +VE DNA POLYM. 3) +VE PCR 4) ↑↑ ENZYMES. 5) BIOPSY. "BRIDGING N."	GIVEN E RibAVIRIN ✓ ✓ ✓
• <u>S/E</u>	1) Flu like + Arthralgia ⇒ PARACETAMOL. 2) BM (-) ⇒ # Thrmbo-cytopenia. <i>most imp. bcc. in CLD the pt. has:</i> A) hyper-splenism at PH. B) Bl. tendency. (1972) 3) TERATOGENIC ⇒ # pregnancy. 4) Hemolytic ANEMIA. 5) Depression.	

"PEGylated" INTERFERON

(1 ampoule 180 ?qm SC ONCE/wk.)

FOR 4 MS.

FOR 1 yr.

+ Add RibAVIRIN

Other Drugs

LAMIVUDIN. (Oral)
for 1-2 ys.
ALONE OR E INTERFERON

STERoids

FULL DOSE

30 MG /D

GRADUAL W
TO ½ DOSE

10-15 MG/D

LOW MD

10-15 MG/D
FOR 6 MS.

CLINICAL & LAB TESTS / MONTH
& LIVER BIOPSY AT 6TH M

FULL REMISSION

CONTINUE STEROIDS &
RESTART if Relapse OCCURS.

NO REMISSION

CONTINUE STEROIDS
+ Azathioprine
"steroid sparing"

FOR 2-3YS OR FOR LIFE ... SO WHEN TO STOP??!

- -ve ANA MARKER.
- NORMAL:
TRANSM. – Bilirubin.
γ Globulin – Biopsy.

Portal Hypertension

CAUSES

Pre-sinusoidal: (MCQ)

- B – Sarcoidosis.
- 1st Biliary Cirrhosis. "GR. in PT"
- PV THROMBOSIS.

Sinusoidal:

- LIVER CIRRHOSIS. (M/C)
- Alcoholic LD*.

Post-sinusoidal:

- HV occlusion. "Budd Chiari \$"
- CV occlusion. "VENO-OC. & *"

Humoral factors:

- ↑ Endothelin ⇒ VC.
- ↑ NO & GLUCAGON ⇒ VD → ⊕ RAS
→ SALT RETENTION → MAINT. PH

CL./P of ...

of the Cause

CHRONIC LIVER D.
"CIRRHOSIS"

PH

- 1) Asymptomatic.
- 2) splenomegaly
if dt Cirrhosis ± collaterals
on Abd. Wall.

COMPLICATIONS OF PH

- hematemesis due to:
 - ✓ rupture EV. "painless – profuse"
 - ✓ rupture PU. "painful – scanty"
- RF dt Toxins + lge → shock → pre-RF = ATN.
- hyper-splenism. "pan-cytopenia"
- H. ENCEPH. (P-S) "if high protein diet"

INVEST.

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> • LFTs. • Stool / URINE for B ova. • Biopsy. "diagnostic" | <ul style="list-style-type: none"> • SONAR: ↑ PV D • Duplex SCAN. | <ul style="list-style-type: none"> • Endoscopy. (Grading) • BA swallow. |
|---|---|---|

TREATMENT of rupture EV

PATHO-PHYSIOLOGY

- 1) Splenic CV ⇒ Splenomegaly
→ Hyper-splenism.
→ Pan-cytopenia.
- 2) Gastric CV ⇒ Gastropathy
→ Dyspepsia
→ GIT bleeding
- 3) Intestinal CV ⇒ Dyspepsia.
- 4) P-S Shunts ⇒ H. Enceph.
⇒ Caput medosa EV
تاك هي المشكلة
- 5) Ascites ⇒ Localizing factor

MEDICAL

Shock

- BLOOD
- FLUID
- PLASMA
- VIT. K

H. ENCEPH.

E N L

PORTAL BP

(VC of mesenteric BVs. → ↓ Bl. flow to intestine → ↓ PH)

DURING THE ATTACK

- 1) VASO-PRESSIN Non-(S) → M1 so add nitrates
- 2) Terli-PRESSIN (S) → no systemic SE
- 3) OCTEREO-TIDE Somato-statin analogue.

IN-BETWEEN (Indral)

- MOST EFFECTIVE
- ↓ HR TO 75%.
- ↓ COP
- "S/E → no comp. ↑ HR if the pt. bleeds"

INSTRUMENTAL

INJ. SCLERO-TH.

(BEST DURING EMERGENCY)

OBLITERATES
THE LUMEN.

BUCRYLATE
(histocryl®)

BANDING

(SANG-STAKEN TUBE)

MECH. COMP. OF
RUPTURED EV

(TRANSIENT TILL
SCLERO-TH. IS DONE)

SURGICAL

P-S SHUNTS

- 1) PORTO – CAVAL.
- 2) MESEN-CAVAL.
- 3) LINEO-RENAL.
- 4) TIPSS. (TTT. of
EV / HE in decomp.
liver / Ascites)

SPLENECTOMY

DE-VASCULARIZATN

"HASSAB OP."

"Ascites"

"excess accumulation of fluid in peritoneal cavity"

> PATHOGENESIS

↓ protein synthesis

↓ s. ALBUMIN

↓ ONCOTIC PR.

ESCAPE OF FLUID TO ISF

HYPO-VOLEMIA

VD dt (NO & PG) + HYPO-VOLEMIA

⇒ ↓ IV VOLUME ⇒ ⊕RAS ⇒ ⊕ALDOSTERONE & ADH.

Others

Hormones

"↑ production dt* & ↓ breakdown"

- 1) ALDOSTERONE
- 2) ADH.
- 3) ANP.

PH

↑ capillary pr. in splanchnic area.

localizing f. ⇒ doesn't cause Ascitis Alone

> CAUSES OF ASCITES

CIRRHOSIS

NON-HEPATIC

e LL edema

No LL edema

Generalized

Others

Heart

CHF

+VE HISTORY

Kidney

NEPHROTIC S

(PUFFINESS + PROTEINURIA)

• ACUTE PANCREATITIS ⇒ HGIC.

• OVARY ⇒ MDG's S (OVARIAN TUMOR + ASCITES + RT. EFFUSION)

• MEYXEDENA.

• BUDD CHIARI S.

Local Causes

(LUMBARITIS for Bimby)

• TB peritonitis.

"Un-let. Shifting dullness dt localized Ascitic fluid"

• Mesothelioma. Wt loss

• METASTASIS FROM CANCER OVARY.

Ascites praecox

• Cirrhosis + Diuretics.

"dt LOCALIZATION BY PH"

• CONST. pericarditis.

> CL/P of Ascites

1) Inspection:

- a) G. ABD. DISTENSION MAINLY IN FLANKS.
- b) SUB-COSTAL ANGLE ⇒ WIDE.
- c) DIVERGENCE OF RECTI & DILATED VEINS. (dt PH OR IVC OBST.)
- d) UMBILICUS ⇒ EVERTED - SHIFTED DOWNWARDS.

2) palpation:

- a) FLUID THRILL
- b) DIPPING METHOD ⇒ LIVER & SPLEEN ARE FELT.
- c) ABD. SWELLINGS ⇒ IN TB PERITONITIS OR MALIGNANT ASCITES.

3) percussion:

SHIFTING DULLNESS

KNEE ELBOW METHOD.

4) Auscultation:

PUDDLE SIGN

VENOUS HUM OF PH.

> NB: 2nd effects of Ascites

1) Rt. Pleural effusion dt natural channels bet perit. & pleura

2) Apex ⇒ shifted upwards.

3) Edema follows Ascites. (Ascites praecox)

4) Congested neck veins.

NB ⇒ Ascites + PL effusion.

Rt. PL. effusion

⇓

More common dt Natural channels bet Peritoneum & Rt. pleura

Lt. PL. effusion

⇓

Lung pathology (Pneumonia / TB)

Bilateral Effusion

⇓

severe hypoalbuminemia

INVESTIGATIONS FOR ASCITES

1) OF THE CAUSE

2) LAPAROSCOPY: for Malignancy or TB.

3) TAP PING: بزل

- TB $\Rightarrow$ C & S then ZN.
- Pancreatitis $\Rightarrow$ WBC & Amylase.
- Malignancy $\Rightarrow$ Cytology.
- Albumin.

	TRANSUDATE	EXUDATE
CAUSE	PART OF G. EDEMA	INFLAM. / MALIG.
PROTEIN	< 3 GM/DL	> 3 GM/DL
CELLS	$\downarrow\downarrow$	$\uparrow\uparrow$
LDH	$\downarrow$	$\uparrow$
SP. G.	< 1018	> 1018

➤ ALBUMIN GRADIENT

$$(SAAG = p. \text{Albumin} - \text{Ascitic Albumin})$$

≥ 1.1 $\downarrow\downarrow$ < 1.1

TRANSUDATE

EXUDATES

UN-COMPLICATED ASCITES

- PH.
- 3 MAJOR CAUSES OF G. EDEMA.

COMPLICATED ASCITES

- Malignancy
- TB peritonitis.
- SBP.

➤ TREATMENT OF CIRRHOTIC ASCITES بالترتيب

1) REST in bed $\Rightarrow \uparrow RBF \rightarrow DIURESIS.$

2) DIET: $\Rightarrow \downarrow NaCl \text{ TO } 2 \text{ GM/D} + \downarrow \text{WATER TO } 1 \text{ L/DAY ESP. IN HPO-NATREMIA}$

3) DIURETICS: بحذر شديد!!

AIM IS WT. LOSS		SPIRONOLACTONE		LASIX
✗ LL edema ⇓ ↓ ½ kg/Day	✓ LL edema ⇓ ↓ 1 kg/Day	1) START WITH 2) ↑ DOSE GRADUALLY EVERY 4-5 days upto (X 4) • S/E:	100 mcg/D 400 mcg /D GYNÆCOMASTIA.	If No response → Add 40 mcg/D 160 mcg/D ↓ Na / K & BV.

IF RESISTANT TO RDD:

4) IV Albumin infusion.

5) TAPPING:

(2-3 L/session + IV Albumin 10 gm / L)
To avoid RE-ACCUM. & EI)

• CRITERIA FOR SAFE PARA-CENTESIS:

- TENSE ASCITES.
- LL EDEMA
- PT > 40%
- PLATELETS > 40,000/MM³.
- BILIRUBIN < 10 GM%.
- CREATININE < 3 MG% HEPATO-RENAL \$.

6) LAST LINES OF TREATMENT:

a) LE VEEN SHUNT CONNECTS JV & PERITONEUM SC $\Rightarrow$ OBSTRUCTION - INFECTION
V. OVERLOAD. - EI.

b) ULTRA-FILTRATION & RE-INFUSION.

c) TIPSS $\Rightarrow$ ENCEPHALOPATHY IN 30%.

d) LIVER TRANSPLANTATION.

REFRACTORY ASCITES

Def.: DIURETIC RESISTANT RDD.

TTT.: ما بعد ال Diuretics .

CAUSES:

- Check Salt & Albumin level.
- Low salt \$: (stop diuretics + fluid restriction for 2 days $\rightarrow$ then resume diuretics)
- Malignancy & TB peritonitis.
- Bad Kidney functions.
- Weak or Low dose diuretic.

INTERACTABLE ASCITES

CAN'T BE TTT. BY DIURETICS DT
DIURETIC INDUCED ENCEPHALOPATHY.

$\downarrow\downarrow$
LIVER TRANSPLANT

HEPATO-CELLULAR CARCINOMA

➤ DEF.: common malignant tumor

- affecting men
- above age of 40 yrs.

➤ CL/P ⇒ "Cirrhotic pt. & rapid un-explained deterioration" ⇒ HCC ?!!!

1) LCF + ABD. PAIN + JAUNDICE + FAH M.

2) RESISTANT ASCITIS.

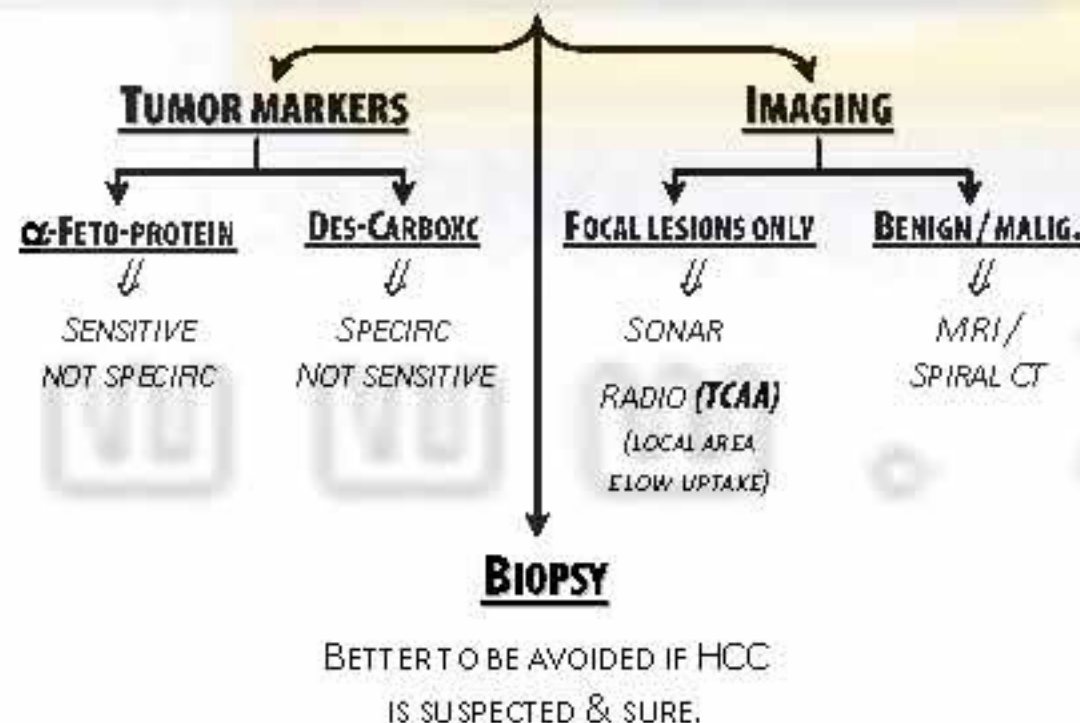
3) Para-malignant S.

- ↑ Insulin → hypo-glycemia. (also dt ↑ CONSUMPTION OF G. BY MALIG. CELLS)
- ↑ PTH → hyper-calcemia.
- ↑ TSH → hyper-thyroidism.
- ↑ EP → Poly-cythemia.

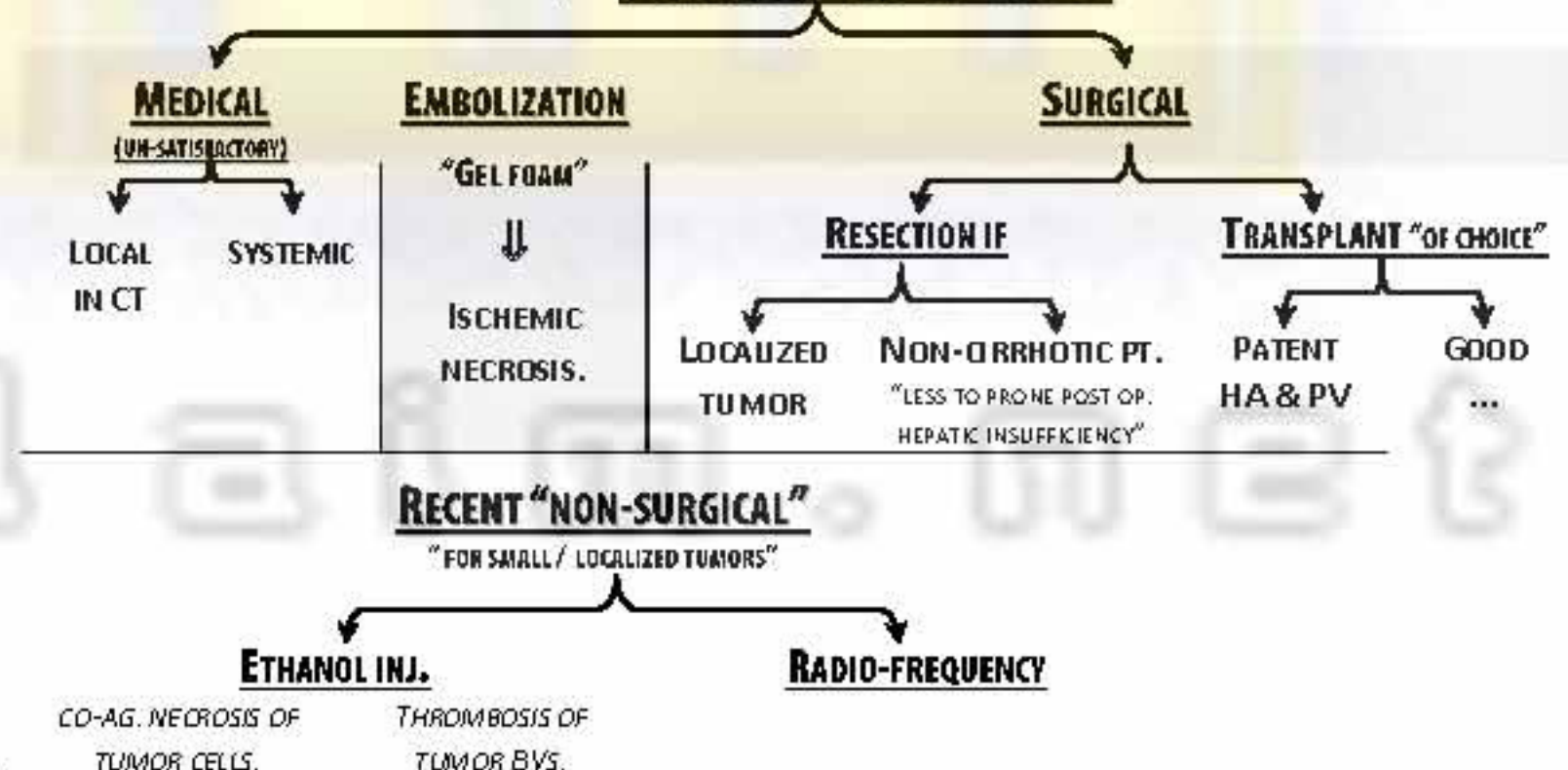
➤ CAUSES (3A + HC)

- 1) HBV – HCV: DNA of HBV integrates with the hepatocyte genome.
- 2) Cirrhosis (Hemato-chromatosis / Alcoholic not Wilson's)
- 3) ALCOHOL is a co-CARCINOGEN & HBV.
- 4) AFLA-TOXIN of A. FLAVUS found in ground nuts.
- 5) ANDROGENS (TTT. of Endometriosis)

➤ INVESTIGATIONS of HCC



➤ TREATMENT OF HCC



	H. HEMO-CHROMATOSIS	Wilson's Disease	Alcoholic Cirrhosis	1 st Biliary Cirrhosis
INVEST. > <u>Cause</u>	1) Iron profile: • ↑ s. IRON & s. FERRITIN. <i>(Not Accurate bec. is an Acute phase reactant)</i> • ↓ IBC. • ↑ TRANS-FERRIN SAT.. "ALSO FOR SCREENING OF FM" 2) ↑ BLOOD & URINE GLUCOSE DT DM.	1) BLOOD: • ↓ Cu dt deposition in TISSUES. • ↓ CERULOPLASMIN OR NORMAL? • ± HEMOLYTIC ANEMIA dt ↑ Cu. 2) URINE ⇒ ↑ Cu → RT DAMAGE → ↑ GLUCOSE, P, AA	HEPATITIS SPECIFIC CRITERIA "GAM,EL" ↑ 1) γGT ENORMAL ALP. "شبيء حميل" 2) AST > ALT (2:1 as Alcohol (-) ALT dt ↓ B6.) 3) IGA 4) MACRO-CYTOSIS NON-MEGALO-BLASTIC. 5) BIOPSY ⇒ MALLORY HYALINE HEPATOCYTE. (NOT-PATHOGNOMONIC)	Biliary Obstruction (BSSA) ↑ 1) BILIRUBIN. (DIRECT) 2) ALP / γGT. 3) s. TRANSAMINASE. "MILD" 4) s. CHOLESTEROL. 5) AUTO-ABS: 1) ↑ Ig M. 2) AMA (ANTI-MITOC. AB TO DIFF. FROM 1st SCLEROSING CHOLANGITIS)
> <u>Cirrhosis</u> (SONAR/BIOPSY)	1) SONAR. 2) BIOPSY ⇒ FE (PRUSSIAN-BLUE)	1) SONAR. 2) BIOPSY ⇒ Cu (E SPECIAL STAIN)	1) SONAR. (BRIGHT FATTY LIVER) 2) BIOPSY... (C ABOVE)	1) SONAR. 2) BIOPSY ⇒ PT GRANULOMA.
> TREATMENT				
1. <u>Causes</u>	1) VENISECTION: • TO MOBILIZE IRON STORES. • WEEKLY / 2 YS. • 3-4 TIMES / YR THEN... 2) Fe Chelator ⇒ DESFROXAMINE TO PT. IF HE CAN'T TOLERATE (1)	• Cu Chelator: 1) PENICILLAMINE. (V. TOXIC) 2) ZN ACETATE. "LONG LIFE"	GENERAL 1) STOP ALCOHOL 2) G. NUTRITION. 3) VIT. B₁ (THIAMINE).	IMMUNE-SUPP. DRUGS 1) AZATHIOPRINE. 2) No STEROIDS used → bec. it can agg. osteo-dystrophy + Osteo-porosis.
2. <u>SYMPTOMATIC</u>	• DM ⇒ INSULIN. • HYPO-GONADISM ⇒ ANDROGENS. • CARDIO-THERAPY.	• TTT of EXTRAMANIFEST. (HAEMO-CHROMATOSIS = defect in SI Wilson's = defect in LIVER itself)	Alcoholic Hepatitis • STERIODS IN SEVER INFLAM. • IV AA. (Essential - Branched) • IV Vit. (B₁ - B₆ - C) • NAC & PENTOXIFYLLINE → TRENTAL®	• Cholestasis ⇒ URSO-Deoxy-cholic. • BS Chelator ⇒ CHOLESTYRAMINE & Bile Acid Sequestrant (-) ENTERO-hepatic circ. • Itching ⇒ ANTI-HISTAMINES ± NALOXONE. • Vit. (ADEK + Ca)
3. <u>Cirrhosis TTT.</u>	Supportive TTT. HEPA-MAX plus URSO-falc Follow Up by.. Child Classif. (LCF / PH) SONAR & α - FP for HCC LIVER TRANSPLANT NOT IN HEMO-CHROMATOSIS "bec. the defect is in SI not Liver"			

LIVER CELL FAILURE

CHEST ⇒ HEPATO-PULMONARY S



"MANIFESTATIONS OF DECOMPENSATED LIVER DISEASE"

➤ **CVS:** ESTROGEN NO-PG-VIP } VD ⇒ hyper-dynamic circ.
⇒ if SEVERE ⇒ Shock.

Endocrine: hypothalamic-pituitary dysf. + ↓ break down of h.

	MALES	FEMALE
GENITALIA	- FEMALE DIST. OF HAIR. - IMPOTENCE & ↓ LIBIDO.	- AMENORRHEA & - INFERTILITY.
BREASTS	GYNAECOMASTIA	ATROPHY.

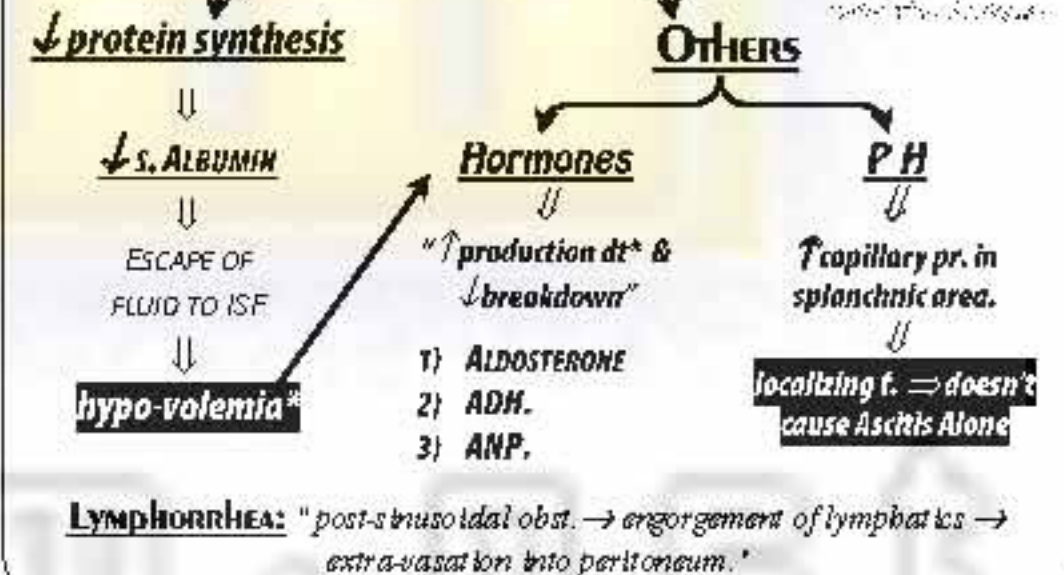
Blood



GENERAL

- 1) **GC ⇒ bad.**
- 2) **Fever "low grade"**
 - RES DEFECT → BACTEREMIA.
 - ↑ IL₁ - TNF.
- 3) **Foetar Hepaticus dt: MERCAPTANS** absorbed from SI
→ bypass hepatic detox
→ excreted in muth & breath.
- 4) **Jaundice.** (sign of decomp. in chronic liver D in acute liver disease dt Cholestatic jaundice).

Ascitis & Edema dt



Skin

- Spider naevie.
- Palmar Erythema.
- White nail. (Terry's Nail)
- Paper money skin.

HEPATIC ENCEPHALOPATHY

➤ DEF.: NEURO-PSYCHIATRIC COMPLEX dt $\uparrow$ brain (NH_3 / Toxins)

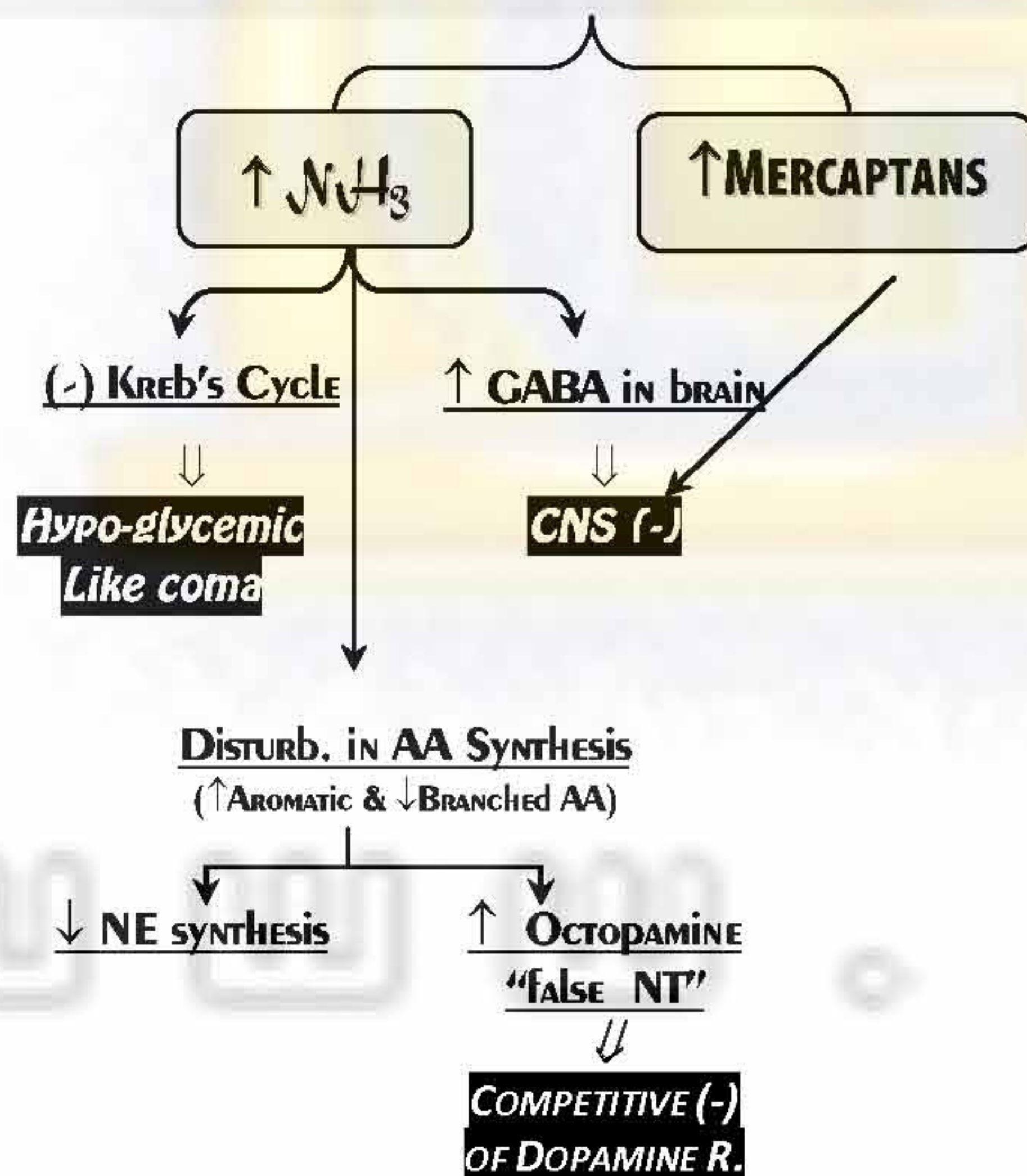
OCCURRING AT THE PEAK OF LCF DT:

- Failure of liver detoxification &
- By pass PORTO-SYSTEMIC SHUNTS.

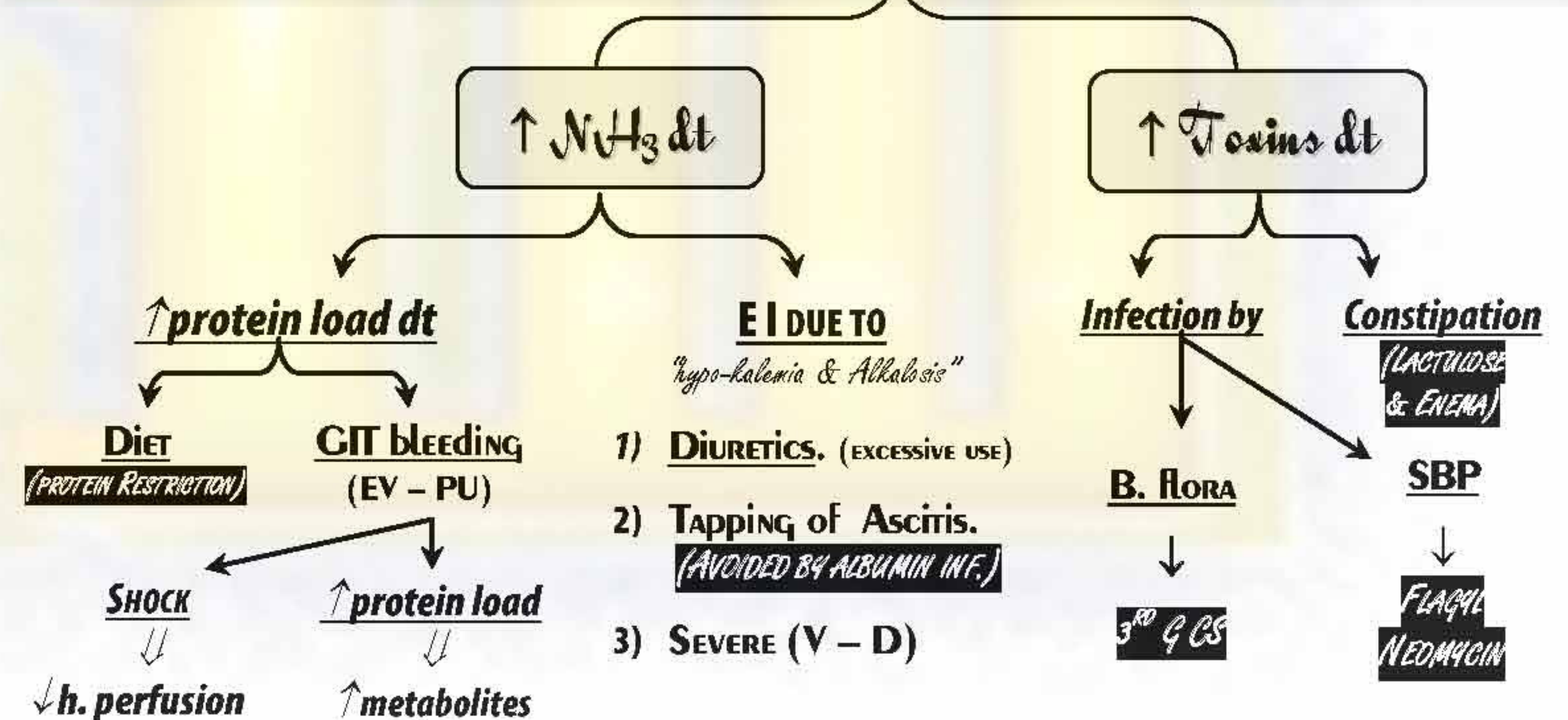
➤ TYPES

- FULMINATE** HE. (ACUTE LIVER DISEASE)
- CIRRHOTIC** HE. (FOLLOWING PPT. FACTORS)
- CHRONIC P-S** HE. (DT SPONT. SHUNTING IN PTS. E PH)

➤ Pathogenesis: $\uparrow$ protein load leads to



➤ Precipitating Factors



DD of HE Delirium

- | | | |
|------------------------------|------------------------|------------------|
| 1) D. TREMENS. (DIAZEPAM) | 5) DRUNKENNESS. | (1) هیجان شدید. |
| 2) H YPO-GLYCEMIA. (GLUCOSE) | 6) H YPOXIA. | (2) سلوك غريب. |
| 3) H. ENCEPHALOPATHY. | 7) SUB-DURAL H EMATOMA | (3) تدهور الوعي. |
| 4) PSYCHIATRIC DISORDER. | | |
- OLD AGE
TRIVIAL TRAUMA

HEPATIC ENCEPHALOPATHY

> Cl./P of H. Encephalopathy

CLINICAL DIAGNOSIS
MAINLY.

LAB INVEST.

TO CONFIRM LIVER D.
NOT ENCEPHALOPATHY

⇓
(↑ PT - ↑ BILIRUBIN - ↓
ALBUMIN)

> Stages

Pre-coma

Coma

- 1) DETERIORATING GC.
- 2) ABNORMAL BEHAVIOR - CHILDISHNESS.
- 3) EXCITED.
- 4) DYSARTHRIA / CHOREA / YAWNING / HICCOUGH.
- 5) FLAPPING TREMORS. "ASTREXIA"
- 6) HYPER-REFLEXIA - HYPER-TONIA.

⇓
responds to
painful ⊕ only.

EARLY DIAGNOSIS BY

> PRIMITIVE TESTS

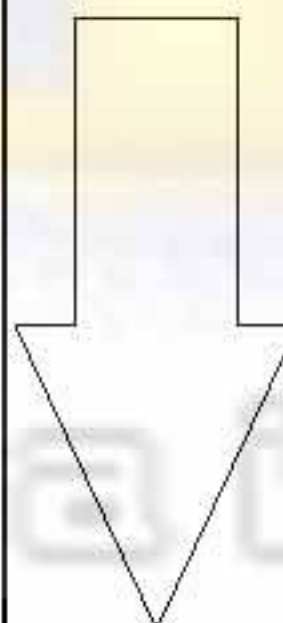
CONSTRUCTIONAL
APRAXIA.

NUMBER
CONNECTION TEST.

> LABS INVEST.

- 1) EEG ⇒ DELTA W. (SLOW
& ↑ AMPLITUDE)
- 2) VEP
- 3) BLOOD NH₃.

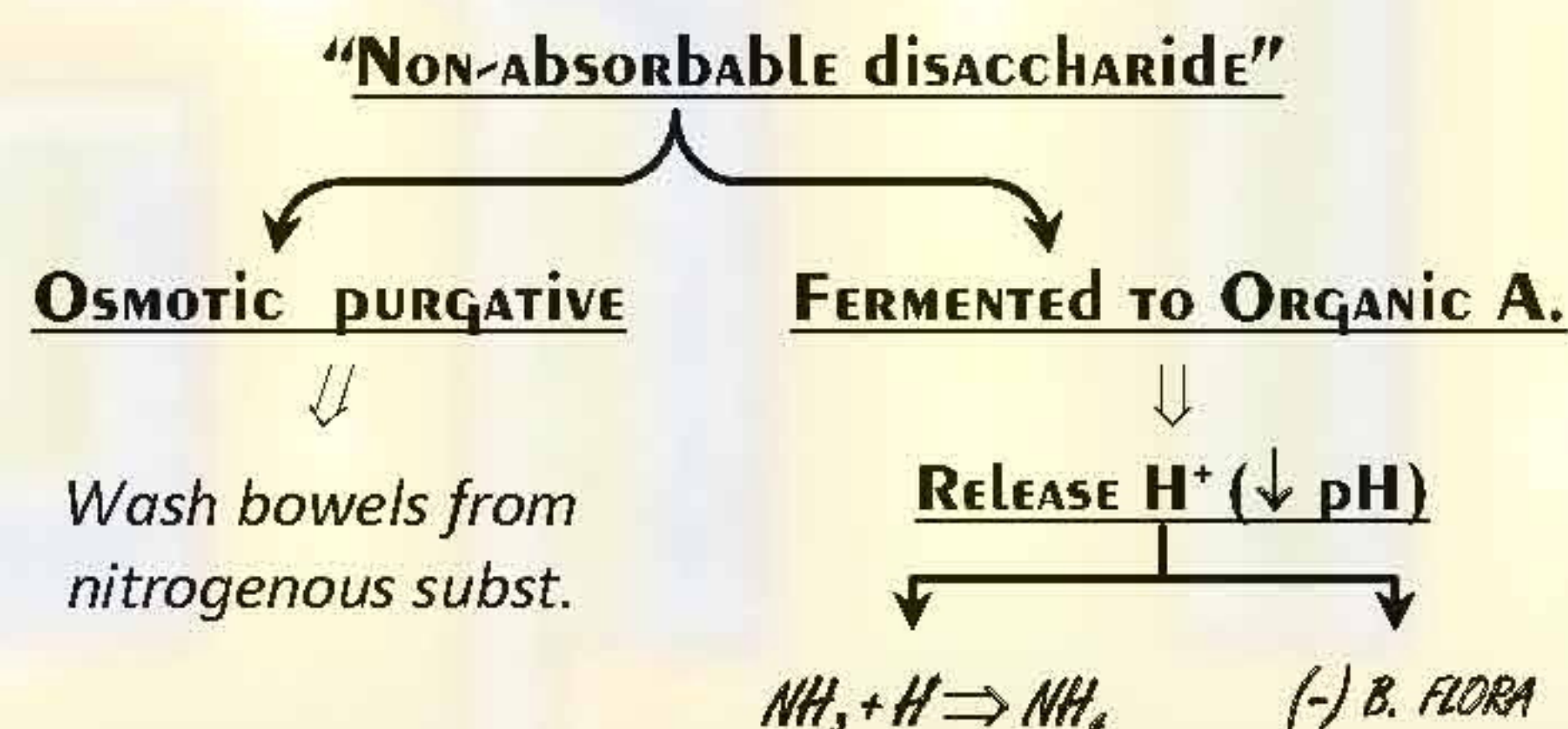
> GRADING OF H. ENCEPHALOPATHY



0	Sub-clinical ↓ INTELLECTUAL FUNCTIONS.
I	Apathy + Reversal of Sleep rhythm + Flapping T. + Confusion + Agitation.
II	Lethargy ⇒ RESPOND TO VERBAL ⊕ + FLAPPING T.
III	Stupor ⇒ RESPOND TO VIGOROUS ⊕ + HYPER-REFLEXIA.
IV	Coma: a) <u>Early</u> ⇒ ... TO PAIN b) <u>Late</u> ⇒ X TO PAIN.

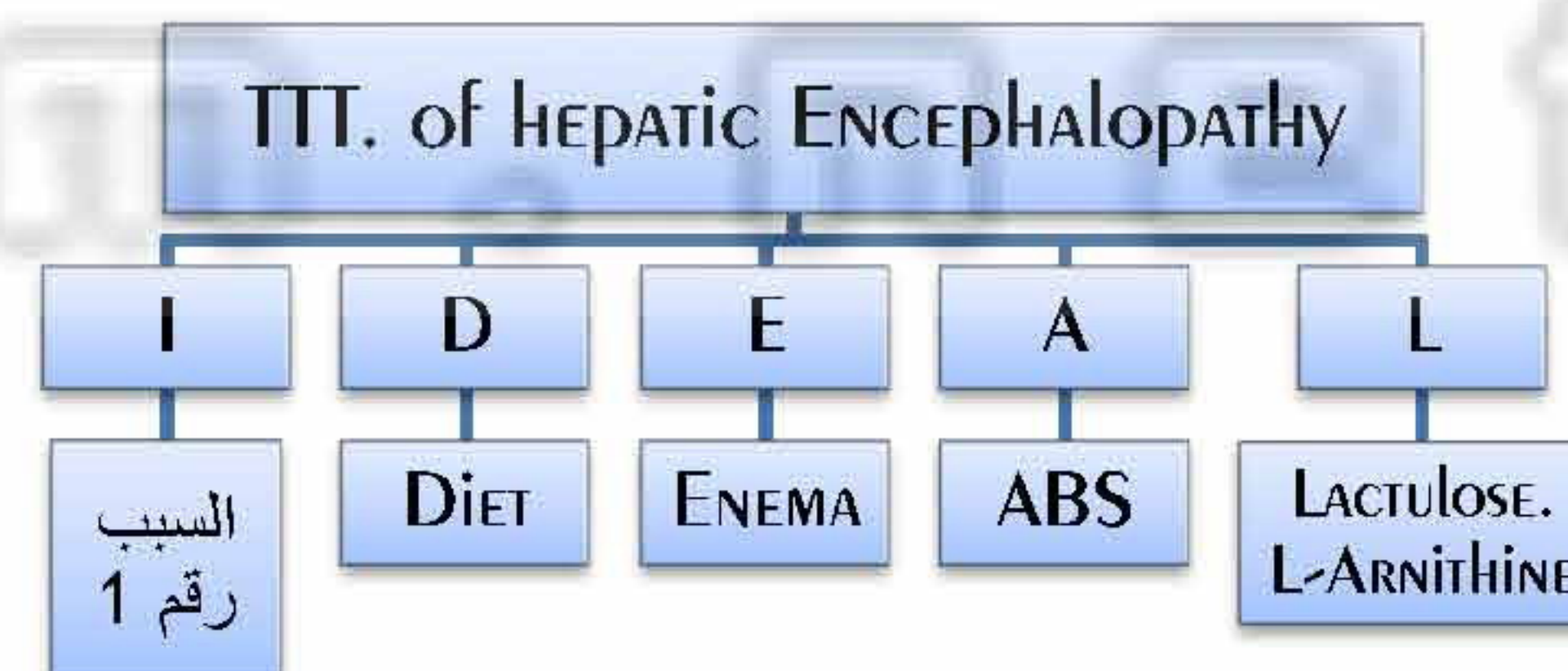
TREATMENT OF H. ENCEPHALOPATHY

1) Avoid ppt. factors.	Stop diuretics.	➤ NB: If sedation is necessary (violent pt.) a) SHORT ACTING BZD → Midazolam. b) Anti-dote → Flumazinel. L-ARTHININE, L-ASPARTAE (HEPAMERZ®) ⇒ ↓ blood NH₃
2) PROTEIN RESTRICTION	(قطعة لحمية صغيرة) = 0.6gm / kg / d	
3) B. flora	Flagyl & Neomycin. NEPHRO- & OTO-TOXICITY. "OBSOLETE"	
4) INFECTION (SBP)	3 rd CS OR Cipro-floxacin.	
5) ENEMA / 8hrs. acc. to need.		
6) LACTULOSE (10-30 ml / 8 hrs.)	↓ "Dose is adjusted to produce 2 semi-soft stools / Day." "If not ⇒ severe diarrhea ⇒ EI ⇒ H. encephalopathy"	

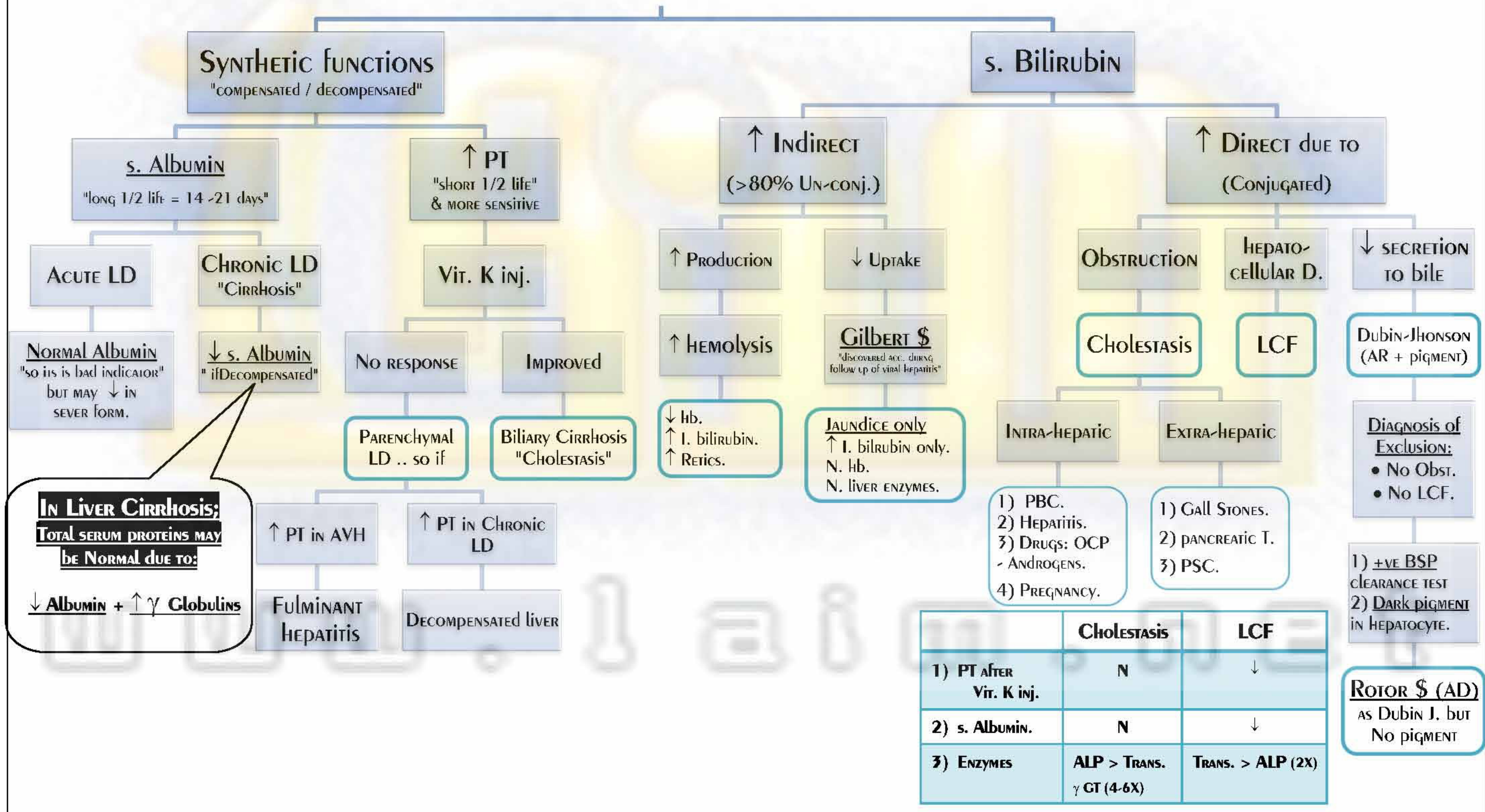


➤ RECENT TRENDS IN TTT. OF H. ENCEPHALOPATHY:

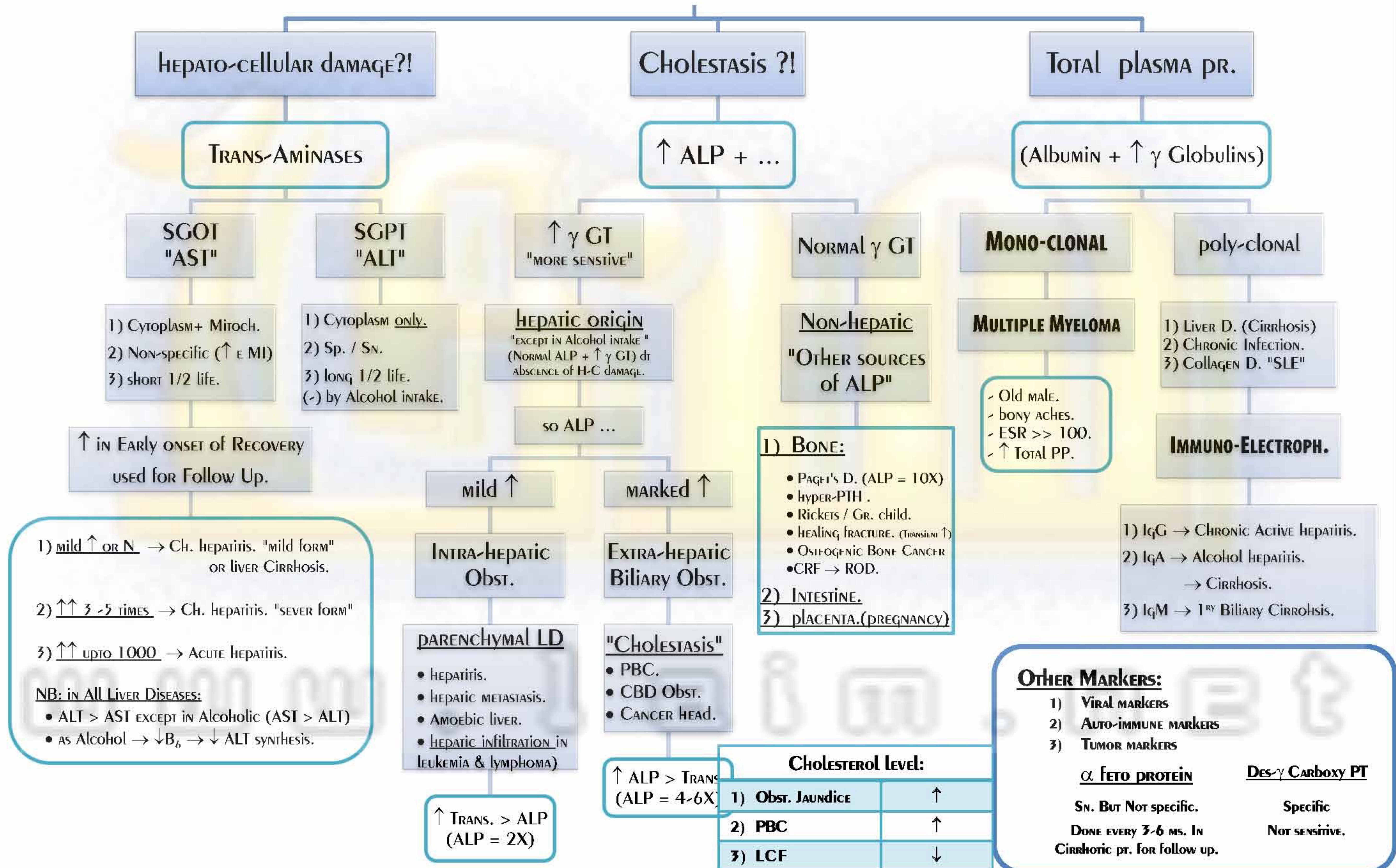
- 1) **HAEMO-PERFUSION.**
- 2) **FLUMAZINEL** DT HYPER-SNSTIVE BZD -R.
- 3) **BIO-ARTIFICIAL LIVER SUPPORT.**
- 4) **LIVER TRANSPLANT.**



LIVER FUNCTION TESTS



LIVER BIOCHEMISTRY



Lab values for LIVER INVESTIGATIONS

1) PT	10 – 14 sec.
2) ALT / AST	0 – 35 U/L
3) ALP	50 – 175 U /L
4) CHOLESTEROL	150 – 240 mg/dL (RECOMMENDED < 200 mg/dL)
5) Total plasma pr.	2 – 3 mg / dL
6) s. Bilirubin	
• Total	0.3 – 1 mg /dL
• Direct	0.1 – 0.3 mg/dL
• Indirect	0.2 – 0.7 mg/dL
7) α FP	< 25 ng/mL. SENSITIVE BUT NON-SPECIFIC.

HEPATOTOXIC DRUGS

• ACUTE hepatitis	✓ HALOTHANE. ✓ INH, Rifampicin.
• CHRONIC hepatitis	✓ Methyldopa. - INH. ✓ Nitrofurantoin - Fenofibrate.
• CHOLESTASIS	✓ ANABOLIC STEROIDS. PHENOTHIAZINES. ✓ OCP. TCA ✓ Oral hypoglycemic.
• FATTY LIVER	✓ TETRA-cyclin. Amiodarone. ✓ Na valproate -> (ANTI epileptic). ✓ STERIODS.
• HEPATIC NECROSIS	✓ PARACETAMOL (TOXIC DOSE > 15 gm). ✓ CARBON TETRACHLORIDE. ✓ AMANITA MUSHROOMS.
• PELIOSES HEPATIS	✓ ANABOLIC STEROIDS. ✓ OCP.
• HYPERSENSITIVITY	✓ Allopurinol. Antithyroid drugs. ✓ Sulfonamides. Penicillins.. ✓ Phenytoin.
• Budd chiari \$	✓ OCP
• ADENOMA	✓ OCP - ANABOLIC STEROIDS
• HEPATOMA	✓ DANAZOLE

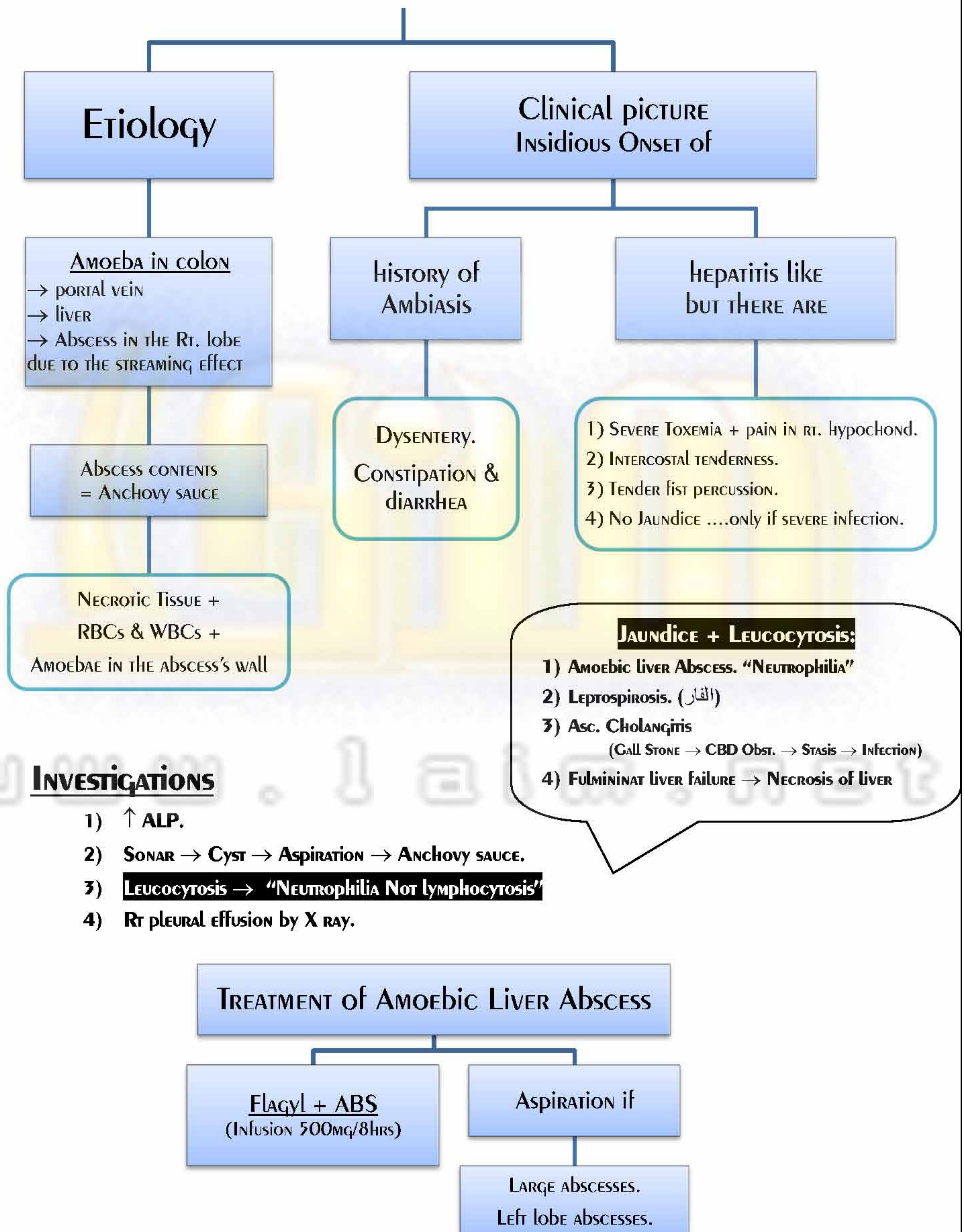
OCP:

- **CHOLESTASIS**
- **PELIOSES HEPATIS**
- **Budd chiari \$**
- **ADENOMA.**

DRUGS CAUSING JAUNDICE= HEPATOTOXIC + DRUGS CAUSING HAEMOLYSIS.

DIRECT TOXICITY	Idio-SYNCRACY
• Predictable. • DOSE DEPENDENT.	• Unpredictable. • DOSE INDEPENDENT → IMMUNE REACTION + DRUG METABOLISM
- ACETAMINOPHEN. - AMANITA MUSHROOM. - CARBON TETRACHLORIDE.	- HALOTHANE. - PHENYTOIN. - ISONIAZIDE. - Na valproate.

Amoebic LIVER Abscess



Fulminant Hepatic Failure

"Acute Liver failure → hepatic encephalopathy + no ppt. factors in < 8 wks."

CAUSES

- 1) Viral → HBV + D – C – E (with pregnancy)
- 2) Drugs → PARACETAMOL Toxicity (> 15gms=30tab), INH.
- 3) Alcohol toxicity + AMANITA poisoning.
- 4) ACUTE fatty liver of pregnancy.
- 5) REYE's Child <5yrs. dt Aspirin in a child with viral infection esp. chicken pox.
- 6) TETRACYCLINE IV especially during pregnancy
- 7) WILSON's disease.

INVESTIGATIONS

- 1) LIVER FUNCTIONS
 - ↑PT.
 - ↑Bilirubin.
 - ↓s. Albumin.
- 2) HEPATO-CELLULAR DAMAGE → ↑TRANSAMINASES,
- 3) US → ↓LIVER SIZE.
- 4) EEG → GRADE of ENCEPHALOPATHY
- 5) ISOTOPE SCAN → NO UPTAKE
- 6) OF THE CAUSE → VIRAL / AUTOIMMUNE MARKERS.

TREATMENT

- a) TREATMENT of h. ENCEPHALOPATHY. (as before)
- b) TREATMENT of Complications

Complication	CAUSES	TTT.
• hypo-glycemia	GLUCONEOGENESIS	→ IV glucose infusion.
• hypo-NATREMIA	↓ FREE H ₂ O EXCRETION	→ FLUID RESTRICTION.
• hypo-kalemia	DIURETICS. GLUCOSE → INSULIN RELEASE	→ KCl 10-15 gm/d
HEMORRHAGE	↓ COAGULATION FACTORS	→ Vit K + FFP
INFECTION	↓ COMPLEMENT	→ ABS
BRAIN EDEMA	disruption of BBB	→ MANNITOL.
HEPATO-RENAL FAILURE	LACTIC ACIDOSIS → NaHCO ₃ .	

Important Notes in Liver

p. 1

LIVER histology:

- 1) LIVER is divided into 8 segments.
- 2) Ito cells → Vit. A & D STORAGE + SYNTHESIZE FIBROUS T.
- 3) Kupffer cells → BL. MONOCYTES.
- 4) GLYCOGEN STORAGE IS ENOUGH FOR 24 HRS.SO ADVANCED LD → FASTING hypo-glycemia.

p. 13

PT. E ↑ TRANSAMINASES

- 1) VIRAL MARKERS → HBS AG / HA AB / HC AB.
- 2) AUTO-IMMUNE MARKERS → ANA.
- 3) CU + FE⁺⁺ profile.
- 4) HISTORY OF HAPTO-TOXIC DRUGS.

p. 19

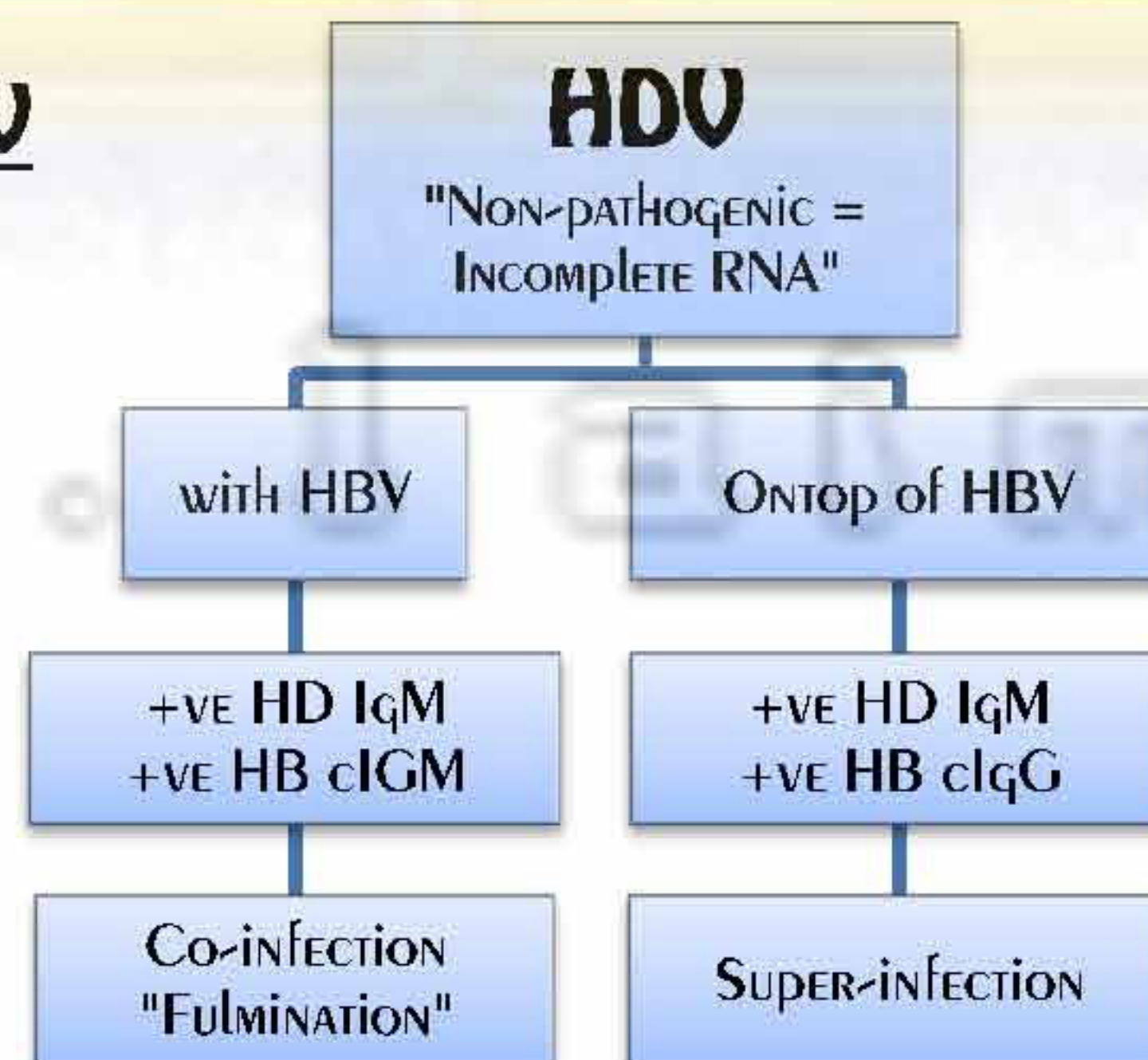
CARRIER & CHRONIC MARKERS ARE ALMOST SAME SO WE DIFF. BY....

- 1) CL/P
- 2) TRANSAMINASES.
- 3) PATHOLOGY by biopsy.

p. 20

Other hepato-tropic VIRUSES

1) HDV



- 2) HEV = A شبه + fulmination in pregnancy.
- 3) HGV = HCV.

p. 21

Just palpable Spleen = few cm BCM.

- 1) Typhoid → Widal test.
- 2) BRUCELLOSIS → Br. Agglutination test.
- 3) IMN → Paul-Bunnell test + Mono-spot + EBV Ab.
- 4) IEC → Echo (Trans-oesoph. for vegetations)
→ Bl. Culture.
- 5) Viral hepatitis → Transam. + Viral Markers.

p. 25

Non-hepatotropic Viruses:

	CMV	IMN	Herpes Simplex
RF	IMMUNE-COMP.	EBV SORE THROAT + .. JAUNDICE pallor hepatitis AIHA (Cold)	IMMUNE-COMP.
INVEST.	INTRA-NUCLEAR INCLUSIONS. GIANT CELLS.	- Atypical Lymphocytosis. - PAUL-BUNNELL – MONO SPOT (Heterophil Ab) Ig (M/C)	Marked ↑↑↑ TRANSAM.
Ttt.	GANCYCLOVIR.	No specific ttt.	Acyclovir.

p. 26

Pt. Complaining of Easy fatigue

- 1) Blood → CBC.
- 2) Liver → SGPT.
- 3) Kidney → s. CREATININE.
- 4) PANCREAS → RBS.

p. 34

Child classification of Cirrhosis = FUNCTIONAL STATE of the liver

	A	B	C
1) s. bilirubin	< 2MG /DL	2-3	> 3
2) s. Albumin	> 3.5 MG/DL	3-3.5	< 3
3) PT	< 4	4-6	> 6
• Ascites	×	MILD	SEVER
• h. Enceph.	×	MILD	SEVER
• NUTRITION.	EXCELLENT	GOOD.	POOR.
• prognosis	GOOD	FAIR	POOR

p. 43

hypoxia & Cyanosis dt

- 1) Fallot.
- 2) Eisenmenger's.
- 3) Intra-pulm. shunts

Mix bet. A-V blood

Doesn't Respond
to O₂ therapy

Chest inf.

Usually responds
to O₂ therapy
except ARDS.

p. 62

Fibro-lamellar Carcinoma

- Variant of HCC.
- young age with No RF. (no cirrhosis or HBV / HCV)
- **INVEST:**
 - a) -ve α FP.
 - b) **SONAR** → *HYPER-ECHOIDIC LESION.*
 - c) **Biopsy** → *MALIGNANT HEPATOCYTES IN DENSE LAMELLAR FIBROUS T. STROMA*
- **BETTER PROGNOSIS THAN HEPATOMA.**

p. 61

Hepatoma Markers

- a) $\uparrow\uparrow\uparrow$ α FP → **HEPATOMA ONLY.**
- b) α FP + CEA → **2RY METASTASIS IN LIVER dt COLORECTAL CANCER.**

p. 63

Fatty Liver (hepatic Steatosis)

liver ++ dt hepatic infiltration e neutral fat

MACRO-VASCULAR: good

- a) Alcohol.
- b) Obesity.
- c) DM (Type II)
- d) TPN

MICRO-VASCULAR: → **FULMINATE FAILURE**

- a) Acute fatty liver of pregnancy.
- b) Reye's \$.
- c) Tetracycline toxicity.

CL./P:

- 1) Of the cause.
- 2) Enlarged tender liver → Rt. Hypo-chondrial pain.
- 3) Fulminate failure in the above causes.

INVEST.:

- 1) of the CAUSE → eg. Bl. Sugar.
- 2) **SONAR** → enlarge homog. Liver.
- 3) **Biopsy** → diagnostic (but not needed)
- 4) **TRANS-AMINASES** → mild $\uparrow$.

III:

- 1) Of the CAUSE, + RESTRICTION of FAT + CHO.
- 2) Lipotropic drugs + of fulminant failure.

FAMILIAL JAUNDICE	RECURRENT JAUNDICE
1) Gilbert \$. (Un-Conjugated) 2) Crigler Najjar \$. (Conjugated) 3) Dubin Johnson\$. (Conjugated) 4) Inherited hemolytic anemia. 5) Wilson's disease. 6) Hemochromatosis. 7) Cholestasis of pregnancy.	1) Hemolytic. 2) Wilson's disease. 3) Gilbert's with fasting. 4) Cholestasis of pregnancy. 5) Gall stones. 6) Peri-ampullary carcinoma.
PAINFUL JAUNDICE	PAINLESS JAUNDICE
1) Calcular jaundice (Gall stones). 2) Hepatitis. 3) Cancer head pancreas 4) Congested liver 5) Hepatoma, fibrolamellar carcinoma	1) All familial jaundice. 2) Any type of cirrhosis.

- 1) AMEBIC LIVER ABSCESS → Rt. PLEURAL.
- 2) CIRRHOTIC ASCITES → Rt PLEURAL.
- 3) CIRRHOTIC ASCITES + Lt. sided eff. → TB if DM + PNEUMONIA.
- 4) CIRRHOTIC ASCITES + BILATERAL eff. → hypo-PROTEINEMIA.

CLP	LIVER Cirrhosis + Ascites → fever + h. ENCEPH. (E our ppr. factors) → SBP.
CA	E. coli – Klebsiella – ENTEROCOCCI.
ROUTE	Blood.
INVEST.	• Aspiration → C & S. • WBCs in Ascitic fluid > 500 /m³ (> 250 PNL / m³)
TTT.	3rd G CS.

	PORTAL VEIN THROMBOSIS	Budd Chiari \$
CAUSES	1) Polycythemia. 2) Tumors (pancreas / hepatoma) → compress PV. 3) Umbilical sepsis.	<u>hepatic V. Thrombosis dt (دم ثقیل)</u> 1) Polycythemia Rubra Vera. 2) OCP. 3) Hyper-coagulable state. (↓ AT-III & protein C, S) 4) PNH. "complement"
CL/P	1) PH..... 2) Transient Ascites (dt opening of collaterals)	1) Rt. Hypochondrial pain. 2) Tender hepatomegaly. 3) -ve <u>hepto-jugular R.</u> "No cong. Neck veins to diff. from RVF or TI"
INVEST.	Duplex scan	
TTT.	1) Of the cause. 2) heparin 3) Surgery in Budd Chiari \$.	
➤ VENO-OCCLUSIVE → as Budd Chiari but central vein. ➤ CARDIAC Cirrhosis → dt long standing RVF / Constrictive Peri-carditis.		

DD of ENLARGED TENDER LIVER (V. Imp.)

- 1) Hepatitis → ENZYMES, MARKERS,
- 2) Amoebic liver → US, ...
- 3) Fatty liver → US,
- 4) Hepatoma → US, AFP.

5) CONGESTED LIVER

RVF → CONGESTED NECK V., LL EDEMA.

BUDD CHIARI \$ → NO CONGESTED NECK VEINS.